



[6450-01-P]

DEPARTMENT OF ENERGY

Record of Decision and Floodplain Statement of Findings for the FutureGen 2.0 Project

AGENCY: Department of Energy.

ACTION: Record of Decision.

SUMMARY: The United States (U.S.) Department of Energy (DOE) announces its decision to provide financial assistance to the FutureGen Industrial Alliance (the Alliance) for its FutureGen 2.0 Project. DOE prepared an environmental impact statement (EIS) (DOE/EIS-0460) to evaluate the potential environmental impacts associated with DOE's proposed action of providing approximately \$1 billion of financial assistance for the project (the majority of which was appropriated under the American Recovery and Reinvestment Act (ARRA)) through cooperative agreements with the Alliance. The EIS evaluated the potential impacts associated with construction and operation of the proposed FutureGen 2.0 Project, which is a public-private partnership formed for the purpose of developing the world's first commercial-scale, oxy-combustion electric generation project integrated with carbon capture and geologic storage. The Alliance, cooperating with Ameren Energy Resources (Ameren), would upgrade one unit in a power plant currently owned by Ameren near Meredosia, Illinois. The repowered unit would include oxy-combustion and carbon capture technologies designed to capture at least 90 percent of its carbon dioxide (CO₂) emissions during steady-state operation and reduce other emissions to near zero. The captured CO₂ would be transported through an approximately 30-mile pipeline to wells where it would be injected approximately

4,000 feet below ground into a geologic saline formation for permanent storage. The project would be designed to capture, transport, and inject approximately 1.2 million tons (1.1 million metric tons) of CO₂ annually, and up to a total of 24 million tons (22 million metric tons) over approximately 20 years. The Alliance would also construct and operate visitor, research, and training facilities related to carbon capture and storage in the vicinity of Jacksonville, Illinois. The DOE-funded demonstration period would last for 56 months from the start of operations (approximately 2017) through 2022.

ADDRESSES: The EIS and this record of decision (ROD) are available on DOE's National Environmental Policy Act (NEPA) website at <http://energy.gov/nepa/nepa-documents> and on the DOE National Energy Technology Laboratory (NETL) website at <http://www.netl.doe.gov/publications/others/nepa/index.html>. Copies of these documents may be obtained from Mr. Cliff Whyte, M/S: I07, National Energy Technology Laboratory, 3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507-0880, ATTN: FutureGen 2.0 Project; electronic mail: cliff.whyte@netl.doe.gov; telephone: 304-285-2098; or by toll-free telephone at 1-800-432-8330, extension 2098.

FOR FURTHER INFORMATION CONTACT: To obtain additional information about the project, the EIS, or the ROD, contact Mr. Cliff Whyte as indicated above under "ADDRESSES." For general information about the DOE NEPA process, contact Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC-54), U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585;

telephone: 202-586-4600; fax: 202-586-7031; or leave a toll-free message at: 1-800-472-2756.

SUPPLEMENTARY INFORMATION: DOE prepared this ROD and Floodplain Statement of Findings pursuant to the National Environmental Policy Act of 1969 (42 United States Code [USC] 4321, *et seq.*), and in compliance with the Council on Environmental Quality (CEQ) implementing regulations for NEPA (40 Code of Federal Regulations [CFR] parts 1500 through 1508), DOE's implementing procedures for NEPA (10 CFR Part 1021), and DOE's Compliance with Floodplain and Wetland Environmental Review (10 CFR part 1022). The decisions announced in this ROD are based on DOE's final EIS for the FutureGen 2.0 Project (DOE/EIS-0460, October 2013) and other program considerations.

Purpose and Need for Agency Action

DOE considers the advancement of carbon capture and storage technology critically important to addressing CO₂ emissions and global climate change concerns associated with the use of fossil fuels. The purpose of DOE's proposed action is to demonstrate the commercial feasibility of an advanced coal-based technology (oxy-combustion) that may serve as a cost-effective approach to implementing carbon capture at new and existing power plants. The proposed project would also demonstrate commercial-scale integration of transport and permanent storage of captured CO₂ in a deep geologic formation. Implementation of the FutureGen 2.0 Project supports the objectives of the FutureGen Initiative to establish the feasibility and viability of producing low-carbon electricity from coal with near-zero emissions of air pollutants.

One of DOE's primary strategic goals is to protect our national and economic security by promoting a diverse supply of reliable, affordable, and environmentally sound energy.

The development of carbon capture and storage technologies through the FutureGen 2.0 Project would support the ongoing and future use of the nation's abundant coal reserves in a manner that addresses both aging power plants and environmental challenges.

Federal financial support reduces the risks inherent in these first-of-a-kind projects, which without financial assistance would be unlikely to occur.

DOE's Proposed Action

DOE's proposed action is to provide approximately \$1 billion in cost-shared ARRA and other funding through cooperative agreements with the Alliance for its proposed FutureGen 2.0 Project. The estimated total project cost is \$1.68 billion.

Project Description and Location

The FutureGen 2.0 Project would result in the construction and operation of a CO₂ capture facility using oxy-combustion technology to capture at least 90 percent (approximately 1.2 million tons [1.1 million metric tons] annually) of CO₂ during steady-state operation of a repowered electricity generating unit at the Meredosia Energy Center. This existing generating unit is located on a 263-acre site adjacent to the east side of the Illinois River, south of the village of Meredosia in Morgan County, Illinois. The captured CO₂ would be conditioned, compressed, and transported approximately 30 miles via a new pipeline to a new well that would inject into the Mt. Simon Formation (approximately 4,000 feet below ground surface), which is one of the Illinois Basin's major deep saline formations. The primary components of the project are:

- (1) *Oxy-Combustion Large Scale Test* – The Alliance would acquire portions of the Meredosia Energy Center from Ameren and repower an existing unit with oxy-combustion technology. Principal construction features would include a new air separation unit to generate oxygen, modifications to the power block (including a new boiler and gas quality control system), a new compression and purification unit for the flue gas, and additional modifications (reconstruction of the main cooling tower, two new cooling towers, process water system upgrades, new process water and wastewater treatment systems, and a new 450-foot (maximum) concrete exhaust stack). The new oxy-combustion facility would operate on a blended coal mixture of 60 percent Illinois No. 6 bituminous and 40 percent Powder River Basin

sub-bituminous. The repowered unit would generate 168 MWe of power (gross) and CO₂ suitable for transport by pipeline.

(2) *CO₂ Pipeline* – The Alliance would construct a new pipeline approximately 30 miles long to transport captured CO₂ to a new injection well site northeast of Jacksonville, Illinois. The pipeline would be constructed of either a 12-inch or 10-inch diameter pipe. The proposed pipeline route crosses mostly rural and sparsely developed agricultural lands in Morgan County. The Alliance plans to use existing rights-of-way (ROWs) to the extent practicable to minimize environmental impacts and avoid sensitive resources. The CO₂ pipeline would have an operational ROW with a width of 50 feet and a construction ROW of 80 feet (100 feet in limited circumstances).

(3) *CO₂ Storage* – The proposed project would convey approximately 1.2 million tons (1.1 million metric tons) of CO₂ annually to a new injection site on 9.5 acres northwest of the intersection of Beilschmidt Road and Martin Road in eastern Morgan County. The CO₂ would be injected via four horizontally drilled injection wells into the Mt. Simon Formation approximately 4,000 feet below the surface, and would be confined in the geologic saline formation by an overlying impermeable caprock layer (the Eau Claire Formation) approximately 480 feet thick. The maximum extent of the subsurface CO₂ plume after 20 years of injection would be approximately 4,000 acres based on modeling results; the Alliance has acquired the subsurface rights of 6,800 acres for the modeled plume. The Class VI Underground Injection Control (UIC) permits to be issued by the U.S.

Environmental Protection Agency (USEPA) for the four horizontal injection wells require the implementation of a monitoring, verification, and accounting (MVA) program to assess the injection and geologic storage of CO₂ and to verify that it stays within the target formation. The MVA program, including monitoring wells and other technologies, would proceed throughout the planned injection period (20 years) and continue for another 50 years or until such time as the USEPA is satisfied that the plume is stable and no further monitoring is required.

- (4) *Educational Facilities* – The Alliance would construct and operate visitor, research, and training facilities (the educational facilities) to support public outreach and communication, and to provide training and research opportunities associated with near-zero emissions power generation and CO₂ capture and storage technologies. The intended general location for the educational facilities is the vicinity of Jacksonville, which is the largest community in Morgan County. The Alliance has been working with local stakeholders to identify a location that would be advantageous to the FutureGen 2.0 Project and to the local community. Siting of the facilities would require a maximum of 3.5 acres at a location that has access to existing utility infrastructure and roadways.

Alternatives

Alternatives considered by DOE during the original 2003 FutureGen program originated as private-party (e.g., electric power industry) applications submitted to the Department. The FutureGen 2.0 Project is a continuation of the original FutureGen program. In

addition to fully analyzing the potential impacts of the FutureGen 2.0 Project and the no action alternative, DOE considered alternatives for the proposed action in the EIS, including alternative fuel sources, alternative advanced electric generating technologies, alternative retrofitting technologies, alternative sites for the oxy-combustion large scale test, and alternative CO₂ pipeline and storage locations. These alternatives were dismissed from further analysis primarily because they either were already addressed by other programs and projects within DOE's diverse portfolio of energy research, development, and demonstration efforts; because they did not meet the Alliance's environmental, geologic, or siting criteria; or because they would not meet the cost and technology-advancement objectives of the FutureGen Initiative as effectively as the proposed project.

No Action Alternative

Under the no action alternative, DOE would not continue to fund the FutureGen 2.0 Project into the final design, construction, and operational phases. Without DOE funding, it is unlikely that the Alliance (or the U.S. industry in general) would undertake, in the near-term, the commercial-scale integration of CO₂ capture and geologic storage with a coal-fueled power plant. Therefore, the no action alternative represents a "no-build" alternative. Without DOE's investment in this facility, the development of oxy-combustion plants integrated with CO₂ capture and geologic storage would be delayed or not occur at all. While the no action alternative would not satisfy the purpose and need for DOE's proposed action, this alternative was analyzed to allow for comparisons to the effects of the proposed project, as required under CEQ Regulations (40 CFR 1502.14). The no action alternative reflects the current baseline condition and serves as a

benchmark against which the effects of the proposed action can be evaluated. If the Alliance decided to pursue the project without DOE funding, potential impacts would be similar to those evaluated under DOE's proposed action.

EIS Process

DOE initiated the NEPA process by publishing a notice of intent (NOI) to prepare an EIS in the *Federal Register* (FR) on May 23, 2011. DOE stated in that notice that the EIS would analyze the potential environmental impacts at each of three CO₂ storage sites proposed by the Alliance. These sites were located near Jacksonville, Illinois; Taylorville, Illinois; and Tuscola, Illinois. DOE conducted a scoping process that included three public scoping meetings and consultations with interested governmental agencies and other stakeholders. DOE held public scoping meetings in Taylorville, Tuscola, and Jacksonville during the 30-day public scoping period, which ended on June 22, 2011.

Following the public scoping period and after consideration of the comments received, DOE prepared a draft EIS that analyzed the potential environmental impacts of the construction and operation of the FutureGen 2.0 Project and the no action alternative. During the preparation of the document, the Alliance determined that CO₂ injection and storage at the Jacksonville site, located in Morgan County, was the only suitable option as the quality of the geologic storage site was acceptable and the prohibitive costs involved in transporting the CO₂ for substantial additional distances to Taylorville and Tuscola made the other sites unreasonable. As a result, the Taylorville and Tuscola sites were removed from further consideration, and the draft EIS analyzed the potential environmental impacts of CO₂ injection and storage at the site near Jacksonville only.

DOE and the USEPA both published notices of availability (NOAs) for the draft EIS on May 3, 2013. DOE's NOA (78 FR 26004) also announced its plans for a public hearing, which was held on May 21, 2013, in Jacksonville.

DOE listened to questions and concerns during an informal session before the hearing and received oral comments on the draft EIS at the public hearing. During the 45-day public comment period, which ended June 17, 2013, DOE received comment letters from the USEPA, U.S. Department of the Interior, and Illinois Department of Agriculture.

Comments also were received from one local elected official, four non-governmental or public-private organizations, and seven members of the public.

Comments included concerns regarding: (1) the adequacy of technical and financial information about the project; (2) potential socioeconomic impacts and risks; (3) the suitability of the proposed geologic formation for storage of CO₂; (4) the effectiveness of the project to mitigate potential climate change; (5) potential health and safety risks associated with leakage from the CO₂ storage formation or the pipeline; (6) the protection of threatened and endangered species, forest habitat, bald eagles, and migratory birds; (7) the adequacy of the NEPA analysis, definition of purpose and need, and alternatives; (8) connected actions and cumulative impacts related to coal use; (9) potential environmental justice impacts on low-income populations; and (10) potential impacts on surface waters, wetlands, groundwater, prime farmland, and public water utilities. USEPA rated the draft EIS as LO – “Lack of Objections.”

DOE distributed the final EIS in October 2013. The USEPA published a NOA in the *Federal Register* on November 1, 2013 (78 FR 65643). In the final EIS, DOE updated

project information, refined analyses, and responded to all comments on the draft EIS.

Comments Received on the Final EIS

DOE received comments on the final EIS from the USEPA and a concerned citizen, Ms. Betty Niemann. DOE considered these comments during preparation of this ROD.

USEPA, in a letter dated November 27, 2013, indicated that the final EIS adequately clarified issues USEPA had posed on the draft EIS except that USEPA had a remaining comment on fine particulate matter. USEPA recommended that the ROD require either a more detailed and refined analysis that demonstrates that FutureGen 2.0 is not a significant contributor to ambient air quality violations or impose controls/limitations to assure there would be no violations. In response, the Alliance updated the air quality modeling analysis as recommended and the results are discussed in this ROD under Air Quality. The analysis demonstrates that the FutureGen 2.0 Project would not significantly contribute to a modeled exceedance of the 24-hour National Ambient Air Quality Standard for fine particulate matter. In a letter dated December 16, 2013, USEPA stated that concerns raised in the November 27, 2013 comment letter have been resolved, and that USEPA has no additional recommendations.

Ms. Niemann, in a letter and subsequent electronic mail, expressed concern about a range of topics, including among other things: the cooperative agreement between DOE and the Alliance; potential impacts on land use and aesthetics associated with the visitor center in Jacksonville; apparent discrepancies in the acreage required for CO₂ storage, potential for

leaks from the CO₂ storage area, such as from characterization/stratigraphic wells; adequacy of analysis of baseline impacts to landowners under the no action alternative; whether the anticipated environmental benefits of CO₂ reduction are significant enough to justify the project in view of costs and impacts to landowners; adequacy of site-specific information in the EIS; liability issues; and whether the Alliance has the expertise to carry out the FutureGen 2.0 Project. DOE has reviewed the final EIS in light of these comments and determined the analyses in the final EIS are adequate. Many of the issues in these comments were also posed in comments from Ms. Niemann on the draft EIS; responses to those comments are in Appendix I of the final EIS.

Decision

DOE has decided to proceed with cost-shared funding for the FutureGen 2.0 Project, providing the Alliance with approximately \$1 billion through cooperative agreements. The project, potential environmental impacts, and required mitigation measures are described below.

Basis of Decision

DOE based its decision on the importance of achieving the objectives of the FutureGen Initiative and a careful review of the potential environmental impacts presented in the EIS. Clean coal is an essential component of the President's "All of the Above" energy strategy and the proposed project would help DOE meet its congressionally-mandated mission to support advanced clean-coal technology projects. Congress appropriated significant funds to enable DOE to pursue large-scale demonstrations of clean coal technologies, and the FutureGen 2.0 Project is expected to yield significant scientific, commercial, and energy-production benefits. Studies by DOE have identified oxy-

combustion as a potentially cost-effective approach to implementing carbon capture at existing coal facilities, including a large cross-section of the world's existing pulverized coal power plants. Oxy-combustion also has the potential for use in new power plants. Oxy-combustion technology is inherently scalable, making it possible to demonstrate the technology at a relatively small commercial scale, such as the 168 megawatt electricity (MWe), FutureGen 2.0 Project, and then replicate it at larger-scale (e.g., 500+ MWe) power plants. The ability to demonstrate the technology at a smaller but commercially relevant scale offers substantial cost-saving benefits. An important benefit of FutureGen 2.0 will be the data collected during the demonstration period. These data may be used by DOE and others to evaluate whether the project's technologies could be effectively and economically implemented at a commercial scale.

DOE plans to verify the environmental impacts predicted in the EIS and the implementation of appropriate avoidance and mitigation measures.

Mitigation

DOE's decision incorporates measures to avoid or minimize adverse environmental impacts during the design, construction, and operation of the project. DOE requires that recipients of financial assistance comply with all applicable federal, state, and local environmental laws, orders, and regulations. During project planning, the Alliance incorporated various mitigation measures and permit requirements into its project, and the analyses completed for the EIS assumed that such measures would be implemented. These measures are identified in the EIS and incorporated into this ROD as conditions for DOE's financial assistance under the cooperative agreements between DOE and the

Alliance. All practicable means to avoid or minimize environmental harm from the project have been adopted.

Mitigation measures beyond those specified in permit conditions will be addressed in a Mitigation Action Plan (MAP). DOE will prepare the MAP, consistent with 10 CFR Part 1021.331, to establish how the mitigation measures will be planned, implemented, and monitored. The MAP will be an adaptive management tool; therefore, mitigation conditions in it would be removed if equivalent conditions are otherwise established by permit, license, or law. Permit, license, or regulatory requirements are not mitigation actions subject to DOE control and, therefore, would not be included in the MAP.

Through management of its cooperative agreements with the Alliance, DOE will ensure that the Alliance fulfills the monitoring and mitigation requirements specified in this ROD and in the MAP, which is under development. DOE will make the MAP available for inspection in appropriate locations for a reasonable time. Copies of the MAP and any annual reports required by the MAP will also be available upon written request.

Potential Environmental Impacts

In making its decision, DOE considered the environmental impacts of the FutureGen 2.0 Project (DOE's proposed action) and the no action alternative. The potentially affected environmental resources evaluated included: air quality; climate and greenhouse gases; physiography and soils; geology; groundwater; surface water; wetlands and floodplains; biological resources; cultural resources; land use; aesthetics; materials and waste management; traffic and transportation; noise; utilities; community services; human health and safety; socioeconomics; and environmental justice. For analytical purposes, DOE evaluated potential impacts using current baseline conditions where the energy

center is no longer in operation, as well as using historical baseline conditions prior to the 2011 suspension of operations at the energy center. DOE also considered the impacts from construction and operation of the FutureGen 2.0 Project in combination with those from other past, present, and reasonably foreseeable future actions (i.e., cumulative impacts).

Best management practices (BMPs) would be implemented and all necessary permits would be obtained to minimize potential impacts and to comply with regulatory requirements during construction and operation. The following sections discuss the key potential impacts of the project.

Air Quality

Construction of the FutureGen 2.0 Project would result in short-term, minor, localized increased tailpipe and fugitive dust emissions. Emissions would be concentrated at the construction sites and would steadily decrease with distance. Construction-related emissions would be reduced with the implementation of industry standard BMPs, including control of vehicle speeds, minimizing or stabilizing exposed areas to reduce wind erosion, wetting exposed areas and roads with water or appropriate surfactants, reducing or eliminating equipment idling time, and using properly maintained equipment. The proposed project would occur in an area listed as either in “attainment” or “unclassified” for all criteria pollutants. Clean Air Act conformity requirements are not applicable and thus there are no emissions thresholds that pertain to the construction phase of this project.

Air dispersion modeling, using USEPA’s model AERMOD, was performed to assess the potential air quality impacts of the proposed FutureGen 2.0 Project during operations and

to demonstrate compliance with the National Ambient Air Quality Standards. The modeling results indicated that emissions of criteria pollutants or hazardous air pollutants during operations would not exceed relevant air quality or health standards when analyzed as an isolated project or when analyzed cumulatively with applicable regional sources. In response to a recommendation from the USEPA based on its review of the final EIS, the Alliance updated the air quality modeling analysis regarding the potential impacts of the proposed FutureGen 2.0 Project on the region's ability to meet the 24-hour National Ambient Air Quality Standard for particulate matter less than 2.5 microns in diameter (PM 2.5). This updated modeling analysis corrects the State of Illinois' emissions inventory to account for an over-prediction in PM 2.5 impacts and therefore provides a more accurate assessment of the project's potential PM 2.5 impacts. The results of this updated analysis demonstrate that the FutureGen 2.0 Project would not significantly contribute to a modeled exceedance of the 24-hour PM 2.5 standard. (See final EIS at pages 3.1-23). Emissions would be well within the limits of the facility's air permit issued by the Illinois Environmental Protection Agency on December 13, 2013. The project would not jeopardize the attainment status of the region for any criteria pollutant; nor would the project impact the air quality or visibility at any Class I areas. During normal operations of the oxy-combustion facility, the gas quality control system would incorporate state-of-the-art flue gas scrubbing technology to minimize criteria pollutant emissions from the stack. Beneficial impacts could result from overall lower emissions, as electricity generated by this project may displace electricity generated by traditional coal-fired power plants that emit significantly higher levels of pollutants.

Climate and Greenhouse Gases

Construction-related impacts resulting from tailpipe emissions of greenhouse gases would be minimized by the use of appropriate BMPs, such as maintaining engines according to manufacturers' specifications, minimizing idling of equipment while not in use, and using electricity from the grid if available to reduce the use of diesel or gasoline generators for operating construction equipment.

The capture and geological storage of greenhouse gas emissions by the project would contribute to beneficial cumulative effects on a national and global scale. The proposed project would capture and sequester approximately 1.2 million tons per year (1.1 million metric tons per year) of CO₂ emissions from the generation of 168 MWe of electric power, which would generate approximately 90 percent less greenhouse gas emissions than a similar conventional coal-fired power plant, or approximately 70 percent less than a natural-gas fired power plant. The reduction in CO₂ emissions resulting from the project would incrementally reduce the rate of their accumulation in the atmosphere and help to incrementally mitigate climate change related to atmospheric concentrations of greenhouse gases. On a broader scale, successful implementation of the project may lead to widespread acceptance and deployment of oxy-combustion technology with geologic storage of CO₂, thus fostering a long-term reduction in the rate of CO₂ emissions from power plants.

The Alliance must design and construct the FutureGen 2.0 Project to capture a minimum of 90 percent of the CO₂ in the treated stream when operating under normal conditions, and use best efforts to achieve at least a 90 percent capture rate during the demonstration period.

Physiography and Soils

Construction of the proposed FutureGen 2.0 Project would increase the potential for soil erosion and compaction, increase the amount of impermeable surfaces, and withdraw some prime farmland soils from agricultural production. Construction of the FutureGen 2.0 Project would temporarily disturb up to 418 acres and permanently alter up to 233 acres. Much of the land at the energy center that would be impacted has been previously disturbed, and all of the agricultural land along the pipeline ROW would be restored for agricultural use after construction. The permanent loss of prime farmland for the entire FutureGen 2.0 Project would be approximately 14 acres located at the injection site.

Impacts to prime farmland soils and agricultural uses resulting from the construction and operation of the FutureGen 2.0 Project would be minimized through compliance with an Agricultural Impact Mitigation Agreement and pollution prevention requirements included in the project's National Pollutant Discharge Elimination System permits and Spill Prevention, Control, and Countermeasures plans.

The Alliance signed an Agricultural Impact Mitigation Agreement with the Illinois Department of Agriculture (included in Appendix H, Agricultural Mitigation, in the final EIS). The Illinois Farm Bureau also participated in the development of the agreement by reviewing and providing comments that were incorporated. The agreement specifies the activities the Alliance would undertake to mitigate any adverse impacts to farmland associated with the construction of the CO₂ pipeline.

Geology

Construction at the Meredosia Energy Center and in the CO₂ pipeline corridor may require excavation of glacial materials. Construction of the injection wells would result

in removal of geologic media through the drilling process. This process would not be unique to the area and would not affect the availability of local geologic resources. Operation of the oxy-combustion facility and CO₂ pipeline would not affect geologic resources. At the injection wells, the potential for CO₂ to migrate out of the injection zone is considered highly unlikely. Computer modeling conducted by the Alliance for their proposed injection well configuration of four horizontal wells installed at one injection well site predicted that the CO₂ plume would expand to encompass an area of approximately 4,000 acres within the CO₂ storage study area over the 20-year injection period. During injection, the Alliance would monitor the formation pressure to ensure that injection-induced seismicity would not occur. The Alliance would also follow a USEPA-approved MVA plan and conduct studies and monitoring to minimize this potential. As required by the UIC permits, appropriate mitigation strategies would be implemented should CO₂ migration be identified.

On November 13, 2013, the Alliance received a Nationwide Permit 12 (NWP-12 – Utility Line Activities) from the U.S. Army Corps of Engineers (USACE) which authorizes the Alliance to conduct trenching activities within two ephemeral streams located within the pipeline ROW

Wetlands and Floodplains

In accordance with 10 CFR Part 1022 (DOE regulations for Compliance with Floodplain and Wetland Environmental Review Requirements), DOE assessed the potential impacts of the proposed project and its connected actions on wetlands and floodplains in the affected area. The Alliance selected sites and a pipeline route that would minimize

impacts to wetlands and floodplains and has committed to implementing methods designed to further reduce impacts.

No impacts to wetlands would occur at the Meredosia Energy Center as a result of the proposed project. If the Alliance undertakes activities related to the proposed barge unloading facility, then temporary impacts could occur resulting in potential increased sedimentation of the Illinois River from disturbance of the river bottom.

The operational ROW for the CO₂ pipeline contains no National Wetland Inventory-mapped wetlands, but may contain up to 0.5 acre of freshwater wetlands based on a wetland delineation performed by the Alliance in spring 2013. While all perennial streams, intermittent streams, and the majority of wetland areas would be avoided using trenchless technologies, trenching could occur during pipeline construction at certain ephemeral streams that are seasonally dry at the time of construction, as well as within a 0.03-acre wetland swale identified during a wetland delineation by the Alliance. This 0.03-acre area of hydric soils is located in an active agricultural field within the proposed pipeline ROW and was originally assumed to be a non-regulated feature. However, a Preliminary Jurisdictional Determination (PJD) received by the Alliance from the U.S. Army Corps of Engineers (USACE) indicated that, based on a significant nexus to the Illinois River, the 0.03-acre wetland area is considered to be a regulated wetland feature of ordinary resource value. Concurrently with the PJD, the Alliance received an approved Nationwide Permit - 12 “Utility Line Activities” (NWP-12) that authorizes trenching activities within this wetland area as well as two ephemeral streams along the pipeline route. The NWP-12 includes numerous permit conditions which must be followed by the Alliance, one of which requires that these features be restored to their

original, pre-construction conditions after construction activities are completed. Since the Alliance would comply with all permit conditions, no permanent impacts to wetlands would occur.

Construction within the 100-year floodplain would occur only in areas that are currently developed at the Meredosia Energy Center; therefore, additional impacts are not expected. If the Alliance undertakes activities related to the proposed barge unloading facility, temporary placement of facilities within the 100-year floodplain would occur during construction, and the area would be returned to pre-construction conditions after construction activities are completed. Construction of the CO₂ pipeline unavoidably would cross 100-year floodplains and may result in small ancillary structures being placed in the 100-year floodplain, resulting in minor impacts. Construction at the CO₂ injection well site would avoid floodplains.

Potential Environmental Impacts of the No Action Alternative

Under the no action alternative, DOE assumed that the FutureGen 2.0 Project would not be constructed and that the current suspension of operations at the Meredosia Energy Center would continue. The impacts under the no action alternative (i.e., “no build”) were evaluated in the EIS and compared to the proposed action. Under the no action alternative, the Meredosia Energy Center, pipeline corridor, and the CO₂ storage site would remain in their current condition with respect to all of the environmental resources evaluated. There would also be no commercial-scale demonstration of the oxy-combustion technology to capture and geologically store CO₂. The development of oxy-combustion repowered plants integrated with CO₂ capture and geologic storage would be

delayed or not occur at all, and the reduction of greenhouse gas emissions from coal-fueled power plants would not be advanced.

Environmentally Preferred Alternative

From a local perspective, the no action alternative is the environmentally preferable alternative, because it would result in no changes to existing environmental conditions. However, from a national perspective, DOE's proposed action is the environmentally preferred alternative. Successful demonstration of the proposed FutureGen 2.0 Project could facilitate the deployment of oxy-combustion, carbon capture, and geologic storage technologies at power plants and other industrial facilities in order to reduce greenhouse gas emissions that would otherwise occur from the continued combustion of fossil fuels, especially coal, by large conventional facilities.

Floodplain Statement of Findings

DOE prepared this floodplain statement of findings in accordance with DOE's regulations entitled "Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR Part 1022). DOE completed the required floodplain and wetland assessment in coordination with development and preparation of the EIS, and incorporated the results and discussion in Sections 3.6, 3.7, and Appendix D of the final EIS. DOE determined that the placement of some project components within floodplains would be unavoidable. However, the current design for the project minimizes floodplain impacts to the extent practicable. Figures 3.7-2, 3.7-3 and 3.7-4 of the final EIS depict the locations of floodplains that cannot be avoided and therefore would be impacted by the construction and operation of the project.

DOE determined that all practicable design layouts at the Meredosia Energy Center would affect the 100-year floodplain associated with the Illinois River and that no wetlands would be affected. Since portions of the existing facility lie within the 100-year floodplain and the project requires the use and reconstruction of these facilities, DOE and the Alliance did not consider alternate sites outside of the floodplain. However, the Alliance developed the project design to minimize impacts to floodplains to the greatest extent practicable. Based on the current design, 15 acres of 100-year floodplain would be impacted, including 7.6 acres of permanent impact areas and 7.4 acres of temporary impact areas (limited to the construction period). Development of approximately 10 acres of impervious surfaces in areas that were previously pervious (e.g., grassy areas) could result in increased flow velocity and a reduction in infiltration rates in these areas. Certain beneficial aspects of floodplains, such as groundwater recharge and water quality maintenance, could also be reduced by an increase in impervious cover within the floodplain. However, these effects would be minor in terms of the size of the newly paved areas relative to the remaining unpaved areas. The structures associated with the proposed oxy-combustion facility would be constructed at the existing energy center within an area that is outside of mapped floodplains. As a result, the proposed structures would not affect the natural or beneficial values of the floodplain.

One of the primary factors in the design of the CO₂ pipeline route was the avoidance of streams, wetlands, and floodplains. Other factors, such as negotiations with land owners, utilization of existing ROWs, and pipeline security and safety concerns were also considered. In addition, the Alliance has committed to using trenchless technologies to install the pipeline beneath all perennial and intermittent streams, as well as most wetland

areas, along the pipeline route. By employing trenchless methods to avoid these areas, the Alliance would also concurrently avoid impacting immediately adjacent or co-located floodplains and wetlands in these areas.

The designated pipeline route for the FutureGen 2.0 Project (referred to as the southern route), would cross 13.2 acres of 100-year floodplain. The majority of floodplain impacts along the pipeline route would be temporary, as the pipeline would be buried and the surface restored to its pre-construction conditions, resulting in only temporary disturbance. Although the pipeline itself would be buried, certain aboveground features associated with the pipeline (e.g., mainline block valves) would be necessary and could result in potential permanent floodplain impacts. However, the impact from these features would be minimal, as they would be limited in number, have small footprints, and would be widely scattered along the 30-mile route. While the exact placement of these small features has not yet been determined, the Alliance has indicated that all surface features would be placed outside of floodplains to the extent possible. As a result, the construction and operation of the pipeline would have a negligible impact on the natural or beneficial values of the floodplains.

The Alliance sited the injection wells and associated infrastructure by selecting areas that did not contain floodplains or wetlands. As a result, these project features would not affect the natural or beneficial values of floodplains or wetlands. The Alliance has not yet determined the location of the educational facilities, which could involve new construction, rehabilitation of existing structures, or a combination of both types of construction. If development requires new construction, it would most likely occur on previously disturbed land that avoids wetlands and floodplains. Therefore, the

construction and operation of the educational facilities are not expected to affect the natural or beneficial values of floodplains or wetlands.

The Alliance has committed to performing all project activities in accordance with all applicable local, state, and federal regulations. The Alliance would ensure that all construction within floodplains is performed in accordance with the requirements of the Illinois Department of Natural Resources (IDNR) and the Morgan County Floodplain Ordinance. The USACE issued a NWP-12 to the Alliance for installation of the CO₂ pipeline. Depending on the types and locations of other proposed construction activities, the Alliance may also be required to obtain additional permits from IDNR prior to any construction activities. In addition to any minimization or mitigation measures required by regulation, DOE and the Alliance have incorporated measures to minimize potential adverse impacts to floodplains into the project design from construction through operation. These measures include, but are not limited to, minimum grading requirements, runoff controls, design and construction constraints and other measures as described in Table 4.2-1 of the final EIS. By incorporating these measures into project designs, DOE and the Alliance would avoid and minimize anticipated adverse impacts to the natural or beneficial values of floodplains and wetlands.

Issued in Washington, D.C. on this 13 of January 2014.

Christopher A. Smith

Acting Assistant Secretary for Fossil Energy

